

**HERBICIDAL PROPERTIES OF TERRESTRIAL INVASIVE ALIEN PLANTS**

*Lantana camara* AND *Panicum maximum*

AGAINST *Pennisetum polystachion* AND *Brassica juncea*

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*Lantana camara* L. and *Panicum maximum* Jacq. are troublesome terrestrial invasive alien plants (IAPs) in Sri Lanka. IAPs endanger ecosystems and biodiversity of native species and cause great economic losses. Value-addition to the IAPs by way of eco-friendly plant-based herbicides can regulate their intensive spreading and damage to ecosystems. The objective of this study was to determine the herbicidal effects of *L. camara* and *P. maximum* on seed-germination and early seedling-growth of *Brassica juncea* (L.) Czern. and *Pennisetum polystachion* (L.) Schult. The air-dried and ground *L. camara* (leaves) and *P. maximum* (whole plant) were extracted into methanol-dichloromethane (1:1) and methanol-water (1:1). The plant powders and solvent-dried extracts were tested in four replicates for their effects on germination of *B. juncea* and *P. polystachion* seeds and then on the early growth of seedlings of the surviving seeds, under laboratory conditions. The plant powders and extracts inhibited the seed-germination of *B. juncea* and *P. polystachion* in varying degrees and potencies. Except for *L. camara* against *B. juncea*, other plant powders and extracts showed a similar trend as follows: dichloromethane-methanol extracts > plant powders > methanol-water extracts having IC<sub>50</sub> (equivalent plant powder) values of 184 ± 15, 445 ± 41, 452 ± 18 and 160 ± 30, 195 ± 31, 738 ± 30 mg for *P. maximum* against *B. juncea* and *P. polystachion*, respectively and 48 ± 10, 170 ± 16 and 323 ± 17 mg for *L. camara* against *P. polystachion*. With respect to *L. camara* against *B. juncea*, the order of potency was plant powder > methanol-water extract > dichloromethane-methanol extract with IC<sub>50</sub> values of 140 ± 12, 275 ± 15 and 494 ± 120 mg, respectively. Methanol-water extracts of *L. camara* and *P. maximum* displayed inhibitory effects on growth parameters of *B. juncea* and *P. polystachion* seedlings such as root length, shoot length and biomass, which increased with concentration. Plant powders and dichloromethane-methanol extracts displayed concentration-dependent variable effects on the growth parameters. The herbicidal phytochemicals of *L. camara* causing inhibitory effects on seed-germination and seedling-growth of *B. juncea* and *P. polystachion* may include one or more of lantadenes, cineol, β-pinene and dipentene. *Lantana camara* and *Panicum maximum* are potential sources for developing eco-friendly plant-based herbicides.

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